USACHPPM
Readiness thru Health
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Just the Facts...

# Japanese Encephalitis

- Japanese encephalitis is a potentially severe viral disease that is spread by infected mosquitoes in the agricultural regions of Asia.
- It is one of several mosquito-borne virus diseases that can affect the central nervous system and cause severe complications and death.
- Japanese encephalitis can be a risk to travelers to rural areas where the disease is common.
- There is no specific treatment for Japanese encephalitis.

A vaccine is licensed for use in travelers whose itineraries might put them at risk for Japanese encephalitis. All travelers should take precautions to avoid mosquito bites to prevent Japanese encephalitis and other mosquito-borne diseases.

**What is Japanese encephalitis?**
Japanese encephalitis is a disease that is spread to humans by infected mosquitoes in Asia. It is one of a group of mosquito-borne virus diseases that can affect the central nervous system and cause severe complications and even death.

**What is the infectious agent that causes Japanese encephalitis?**
Japanese encephalitis is caused by the Japanese encephalitis virus, an arbovirus. Arbovirus is short for **ar**thropod-**bo**rne **virus**. Arboviruses are a large group of viruses that are spread by certain invertebrate animals (arthropods), most commonly blood-sucking insects. Like most arboviruses, Japanese encephalitis is spread by infected mosquitoes.

**Where is Japanese encephalitis found?**
Japanese encephalitis is found throughout rural areas in Asia. Transmission can also occur near urban areas in some developing Asian countries.
Japanese encephalitis is a seasonal disease that usually occurs in the summer and fall in the temperate regions of China, Japan, and Korea. In other places, disease patterns vary with rainy seasons and irrigation practices.

**How do people get Japanese encephalitis?**
The Japanese encephalitis virus has a complex life cycle involving domestic pigs and a specific type of mosquito, *Culex tritaeniorhynchus*, that lives in rural rice growing and pig-farming regions. The mosquito breeds in flooded rice fields, marshes, and standing water around planted fields. The virus can infect humans, most domestic animals, birds, bats, snakes, and frogs. After infection, the virus invades the central nervous system, including the brain and spinal cord.

**What are the signs and symptoms of Japanese encephalitis?**
Most infected persons develop mild symptoms or no symptoms at all. In people who develop a more severe disease, Japanese encephalitis usually starts as a flu-like illness, with fever, chills, tiredness, headache, nausea, and vomiting. Confusion and agitation can also occur in the early stage. The illness can progress to a serious infection of the brain (encephalitis) and can be fatal in 30% of cases. Among the survivors, another 30% will have serous brain damage, including paralysis.

**How soon after exposure do symptoms appear?**
Symptoms usually appear 6-8 days after the bite of an infected mosquito.

**How is Japanese encephalitis diagnosed?**
Diagnosis is based on tests of blood or spinal fluid.

**How common is Japanese encephalitis?**
Japanese encephalitis is the leading cause of viral encephalitis in Asia, where 30,000 to 50,000 cases are reported each year. The disease is very rare, however, in U.S. travelers to Asia. The chance that a traveler to Asia will get Japanese encephalitis is very small: 1) only certain mosquito species can spread Japanese encephalitis; 2) in areas infested with mosquitoes, only a small portion of the mosquitoes are usually infected with Japanese encephalitis virus; 3) among persons who are infected by a mosquito bite, only 1 in 50 to 1 in 1,000 will develop an illness. As a result, less than 1 case per year is reported in U.S. civilians and military personnel traveling to and living in Asia. Only 5 cases among Americans traveling or working in Asia have been reported since 1981.

*U.S. Army Center for Health Promotion and Preventive Medicine*
*5158 Blackhawk Road, Aberdeen Proving Ground, MD 21010-5403*

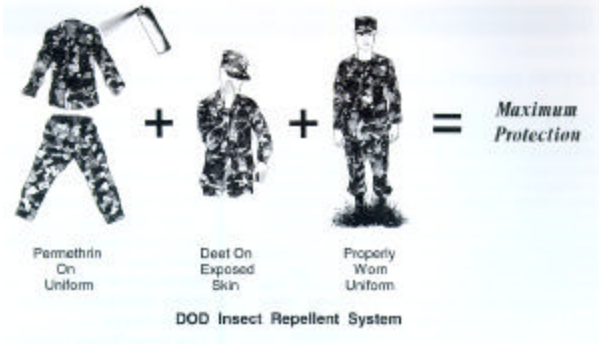
**Who is at risk for Japanese encephalitis?**
Anyone can get Japanese encephalitis, but some people are at an increased risk:

- People living in rural areas where the disease is common
- Active-duty military deployed to areas where the disease is common
- Travelers to rural areas where the disease is common (very small increased risk)

**What is the treatment for Japanese encephalitis?**
There is no specific treatment for Japanese encephalitis. Antibiotics are not effective against viruses, and no effective anti-viral drugs have been discovered. Patient care centers on treatment of symptoms and complications.

**How can Japanese encephalitis be prevented?**
A vaccine is licensed for use in U.S. travelers to rural areas where the disease is common. The vaccine is recommended only for persons who plan to travel in these areas for 4 weeks or more, except in special circumstances such as an ongoing outbreak of disease. Because of the potential for other mosquito-borne diseases in Asia, all travelers should take steps to avoid mosquito bites. The mosquitoes that transmit Japanese encephalitis feed mainly outside during the cooler hours at dusk and dawn. Travelers should minimize outdoor activities at these times, use mosquito repellent on exposed skin, and stay in air-conditioned or well-screened rooms. Travelers to rural areas should use a bed net and aerosol room insecticides.

- Use mosquito repellents on skin and clothing
- Use insect repellents that have been approved by the Environmental Protection Agency (EPA). They are safe and effective.
- For your skin, use a product that contains 20-50% **DEET** (N<N-diethyl-meta-toluamide). **DEET** in higher concentrations is no more effective. Do not use **DEET** on infants (children under 3 years old).
- Use **DEET** sparingly on children, and don't apply to their hands, which they often place in their mouths.
- Apply **DEET** lightly and evenly to exposed skin; do not use underneath clothing. Avoid contact with eyes, lips, and broken irritated skin.
- To apply to your face, first dispense a small amount of **DEET** onto your hands and then carefully spread a thin layer.
- Do not inhale aerosol formulations.
- Wash **DEET** off when exposure to mosquitoes ceases.
- For your clothing, use an insect repellent spray to help prevent bites through the fabric. Use a product that contains either **permethrin** or **DEET**. **Permethrin** is available commercially as 0.5% spray formulations.
- **Permethrin** should only be used on clothing; never on skin.
- When using any insect repellent, always FOLLOW LABEL DIRECTIONS.
- For optimum protection, soldiers should utilize the **DOD INSECT REPELLENT SYSTEM**. In addition to proper wear of the battle dress uniform (BDUs), which provides a physical barrier to insects, this system includes the concurrent use of both skin and clothing repellents:




Standard military skin repellent: 33% **DEET**, long-acting formulation, one application lasts up to 12 hours, **NSN 6840-01-284-3982**. Standard military clothing repellents, either: aerosol spray, 0.5% **permethrin**, one application lasts through 5-6 washes **NSN 6840-01-278-1336**; or impregnation kit, 40% **permethrin**, one application lasts the life of the uniform, **NSN 6840-01-345-0237**. Factory repellent-treated BDUs are also available through the military supply system.

**Where can I get more information on Japanese Encephalitis and other forms of mosquito-borne viral encephalitis?**
Contact the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), Aberdeen Proving Ground, Maryland 21010-5403: DSN 584-3613; CM (410) 436-3613; FAX –2037; or visit our website at: http://chppm-www.apgea.army.mil/ento. Additional information can also be obtained from your local, county or state health departments, your health care provider or by contacting the CDC email: dvbid@cdc.gov, or visit their website: http://www.cdc.gov/ncidod/dvbid/arbor/arboinfo.htm.

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